*sources*, first by the U.S. Geological Survey and since 1925 by the U.S. Bureau of Mines. Of late years these have appeared in two volumes, one on metals and one on non-metals. Now these data appear in a new and more compact form in a single blue-covered volume entitled *Minerals* [illegible] which will be issued more promptly than formerly after the [illegible] issued annually. The convenient availability of the statistical data in a single volume is a welcome innovation.

E. S. B.

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*Invertebrate Zoology*. By ROBERT W. HEGNER. New York City: Macmillan Co., 1933. Pp. 570; figs. 403; pls. VIII. $3.75.

This useful text is a fairly complete revision of Hegner's *Introduction to Zoology* published in 1912. The older volume was limited in scope, since it discussed in considerable detail only a few of the invertebrate animals. The present text has been expanded to include descriptions of all groups of invertebrates. Furthermore, the book is distinctly up to date in that the results of pertinent recent investigations are included.

Students of invertebrate paleontology, who all too commonly are poorly grounded in zoology, will find this text a handy reference work. They will have to remember, however, that zoologists are not likely to be much better in paleontology than paleontologists are in zoology. With this in mind they should not be too surprised to learn, among other things, that the "*Lingula* are apparently the same today as they were in the Silurian period *estimated at about 25 million years ago*," that *Turrilites costatus* is an "*uncoiled* ammonite," or that "*Triarthrus becki* occurs in the Utica shale (*Lower Silurian*)." Nor will all zoologists and paleontologists be in complete agreement with Hegner's arrangement of the phyla "according to their supposed position in the evolutionary series."

But these are details, and the reviewer recommends that this text, or the more advanced *Invertebrata* by Borradaile and Potts, be added to the reference works of serious students of invertebrate paleontology.

CAREY CRONEIS

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*Vertebrate Paleontology*. By ALFRED SHERWOOD ROMER. Chicago: University of Chicago Press, 1933. Pp. vii+491; figs. 359. $3.00.

A comparison of the content of this book with that of an earlier work by A. Smith Woodward clearly emphasizes the remarkable progress made

in vertebrate paleontology in the acquisition of additional information during the past three decades. The subject matter treated in the chapters relating to particular groups of fossil vertebrates is proportioned approximately as in the *Outlines of Vertebrate Palaeontology*. Those chapters dealing with the jawless vertebrates and fishes are relatively shorter, although new material acquired in these fields has not been omitted. Increase in our knowledge of number and type of the higher chordates is particularly evident in the discussion of the reptiles and mammals, less so in the case of the amphibia. Judged in this light, we may conclude from the chapter on birds that no comparable advance has been made in the history of these forms.

The text is written largely from the standpoint of the student in biology interested in the structural characters of fossil vertebrates and in the relationships known or assumed to prevail between extinct and existing forms. In the introductory chapter divers matters are briefly considered; namely, the preservation of vertebrate fossils, the geologic time scale, evolution theories, classification, and vertebrate structure and ancestry. The following chapters afford an appreciation of the ofttimes amazing variety to be found among fossil vertebrates and include statements of the more important morphological and adaptive characters of these and of representative living types. Charts show clearly the distribution of groups in time and phylogenetic trends. The text probably will be found to serve best as a general introduction to vertebrate paleontology. The general reader, moreover, will doubtless find much of absorbing interest in this recounting of the facts of the fossil record. Doubtless the limitations of space did not allow more of the geological background to be woven into the discussion. Brief statements of the occurrence of the more important fossils with citations of specific localities in many instances might have rendered the book even more useful to the student making his approach through historical geology.

A synoptic classification of vertebrates and a very useful bibliography are included. Under the latter I find, however, no mention of the contributions by Loye Miller on fossil birds. The illustrations, of which there are many, have been executed in excellent manner.

CHESTER STOCK

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*The Principles of Historical Geology from the Regional Point of View.* By RICHARD M. FIELD. Princeton University Press, 1933. Pp. xii+283; figs. 108; Pl. 10. $3.50.

This book on historical geology may mark an epoch in the teaching of historical geology like that made by the Harvard Law School when they